WHAT IS CLAIMED IS:

1. A fuel pressure control apparatus for a cylinder injection type internal combustion engine, comprising:

fuel injection valves for injecting fuel directly into combustion chambers of individual cylinders, respectively, of said internal combustion engine;

a fuel rail connected to said fuel injection valves for containing the fuel of a high pressure;

a fuel pressure sensor for detecting the pressure of said fuel contained within said fuel rail as a fuel pressure;

an intake air temperature sensor for detecting a temperature of intake air of said internal combustion engine or alternatively an ambient temperature thereof as an intake air temperature;

a water temperature sensor for detecting a temperature of cooling water of said internal combustion engine as a water temperature;

a high pressure fuel pump for supplying said fuel of high pressure to said fuel rail;

fuel pressure control means for variably controlling said fuel pressure so that said fuel pressure coincides with a desired fuel pressure which conforms to an operation state of said internal combustion engine; and

fuel pressure increase estimating means for estimating an increment of said fuel pressure after stoppage of operation of said internal combustion engine on the basis of said intake air temperature and said water temperature detected during operation of said internal combustion engine,

wherein said fuel pressure control means includes desired fuel pressure limiting means for limiting a maximum value of said desired fuel pressure so that a sum value of said desired fuel pressure and said increment of said fuel pressure does not exceed a critical actuation pressure of the fuel injection valve beyond which a failure of fuel injection may occur.

2. A fuel pressure control apparatus for a cylinder

injection type internal combustion engine, comprising:

fuel injection valves for injecting fuel directly into combustion chambers of individual cylinders, respectively, of said internal combustion engine;

a fuel rail connected to said fuel injection valves for containing the fuel of a high pressure;

a fuel pressure sensor for detecting the pressure of said fuel contained within said fuel rail as a fuel pressure;

a high pressure fuel pump for supplying the fuel contained in a fuel tank to said fuel rail as said fuel of high pressure;

fuel pressure control means for variably controlling said fuel pressure so that said fuel pressure coincides with a desired fuel pressure which conforms to an operation state of said internal combustion engine;

a normally closed type electromagnetic pressure control valve provided to make it possible to establish communication between an intake port of said high pressure fuel pump or alternatively said fuel tank on one hand and said fuel rail on the other hand; and

pressure reduction control means for opening said electromagnetic pressure control valve immediately after stoppage of operation of said internal combustion engine.

3. A fuel pressure control apparatus for a cylinder injection type internal combustion engine according to claim 2,

wherein said pressure reduction control means is so designed as to realize pressure reduction control by opening said electromagnetic pressure control valve over a predetermined period corresponding to a period during which temperature within said fuel rail rises.

4. A fuel pressure control apparatus for a cylinder injection type internal combustion engine according to claim 2,

wherein said pressure reduction control means is so designed as to realize pressure reduction control by opening said electromagnetic pressure control valve for a period taken for said

fuel pressure to become equal to or lower than a critical actuation pressure of said fuel injection valve.